Land Use Change in Canada

Victoria Urban-centred Region 1976-1980

Lands Directorate

Fact Sheet 85-6

Canada Land Use Monitoring Program

The Canada Land Use Monitoring Program (CLUMP) was established in 1978 by the Lands Directorate of Environment Canada to provide researchers, planners and managers with a data base on land-use change. The Program complements the land capability surveys of the Canada Land Inventory.

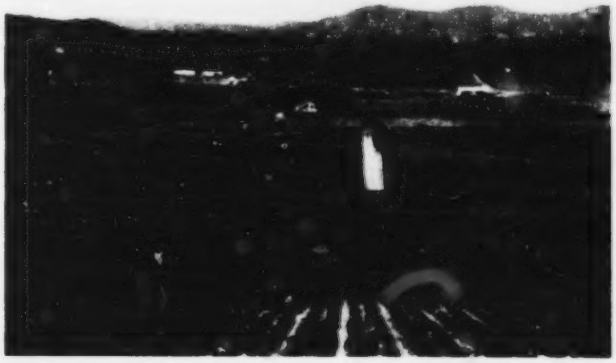
Designed to monitor, both spatially and sequentially, land use and land-use change in various areas of Canada, CLUMP:

- provides improved awareness of the state of the land resource;
- identifies land-use trends of national and regional importance;
- determines major areas of rapid change which can potentially create land-use problems;
- analyses land-use change in terms of causes and consequences, particularly with respect to the impact of government policies and programs.

Four major components of CLUMP are: urban-centred regions, prime resource lands, rural areas and wildlands. The urban-centred region component examines land use in the rural-urban fringe of urban centres with populations of over 25 000. Data will be presented in fact sheets such as this for each urban centre with a population of 100 000 or more in 1981.

Highlights

- The Victoria urban-centred region (UCR) encompasses 74 205 hectares (ha) and has an estimated population of 248 000 people.
- Located on the southeastern tip of Vancouver Island, the study area includes the provincial capital city, Victoria, and the District Municipality of Esquimalt, a naval base and ship-building centre.
- In 1980, four major land uses occupied 80% of the study area: unused (47%), urban undifferentiated (11%), dwelling (11%) and agriculture (11%).
- 2 060 ha of rural land were converted to urban-related uses (dwelling, urban undifferentiated and other urban activities) between 1976 and 1980.
- Over one-quarter of the Victoria UCR has high capability for agriculture (CLI Classes 1-3).
- 42% of the UCR's high agricultural capability land had some form of high-density dwelling, other urban, or urban undifferentiated activity on it by 1980. Agricultural activities occupied 29% of the study area's Class 1-3 land.



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The CLUMP Process

Victoria UCR 1980 land use was classified according to the CLUMP land activity/land cover system using 1:20 000 scale, black and white aerial photographs. This information was augmented by field checks and other sources. Land activity is the active use made of the land, while land cover is the vegetation or artificial construction covering the land surface.

The spatial units drawn on the interpreted aerial photographs were subsequently transferred to base maps at the 1:50 000 scale. The maps were then scribed, digitized and entered into the computerized map storage and retrieval system of the Canada Land Data Systems (CLDS) of the Lands Directorate. This computerized mapping system made it possible to merge adjacent maps and overlay other themes such as shoreline and agricultural capability. The CLDS allows the researcher to analyse graphic and statistical data interactively for the production of tables, maps and reports.

Land-use Change Since 1976

Land-use change data can tell us how much rural land was converted to urban-related uses (residential, commercial, institutional, manufacturing and storing, highways and communications, and site recreation activities) between 1976 and 1980 in the Victoria UCR.

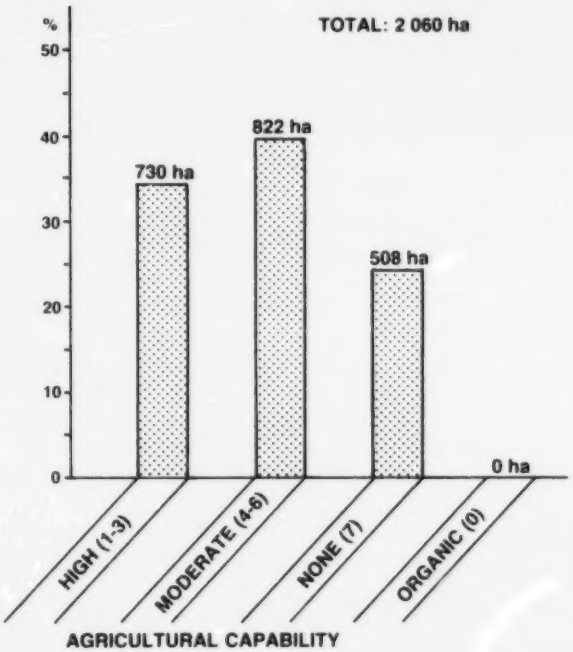
Because different mapping and classification methods were used in the 1976 and 1980 land-use inventories, it is only possible to estimate the net change in built-up uses between these two periods.

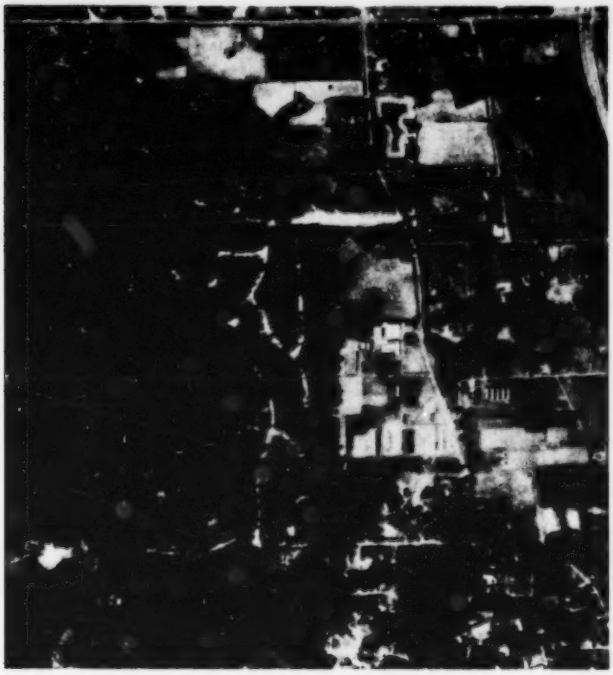
Between 1976 and 1980, urban-related or built-up uses in the Victoria UCR increased by 2 060 ha, for a total of 20 941 ha (includes urban undifferentiated, other urban, and dwelling activities). This represented an 11% increase in the amount of rural land converted to built-up uses, a marked decline from the 31% increase of the 1972-1976 period.

The following histogram indicates the agricultural capability of land converted to built-up uses between 1976 and 1980. Thirty-five percent of the area converted had high capability for agriculture under the Canada Land Inventory (CLI).

In the previous four-year period (1972-76), 43% of the conversion to built-up (urban-related) uses had taken place on high capability land. More land in the moderate capability range (Classes 4-6) went to built-up uses between 1976 and 1980 (40%) than in the 1972-76 period, when 31% of Classes 4-6 agricultural capability land was converted.

CLI AGRICULTURAL CAPABILITY OF LAND CONVERTED TO BUILT-UP USES 1976-1980





North Saanich 1976

North Saanich 1980

(Air photos courtesy of the National Air Photo Library, Ottawa)

The aerial photographs above show land-use change occurring in North Saanich District Municipality (DM) as a result of residential development between 1976 and 1980.

Land Use in 1980

Land use in the Victoria UCR has been divided into nine major categories, four of which encompass 80% of the study area: unused (46.7%), urban undifferentiated (11.4%), residential dwellings (11.1%) and agricultural activities (11.1%).

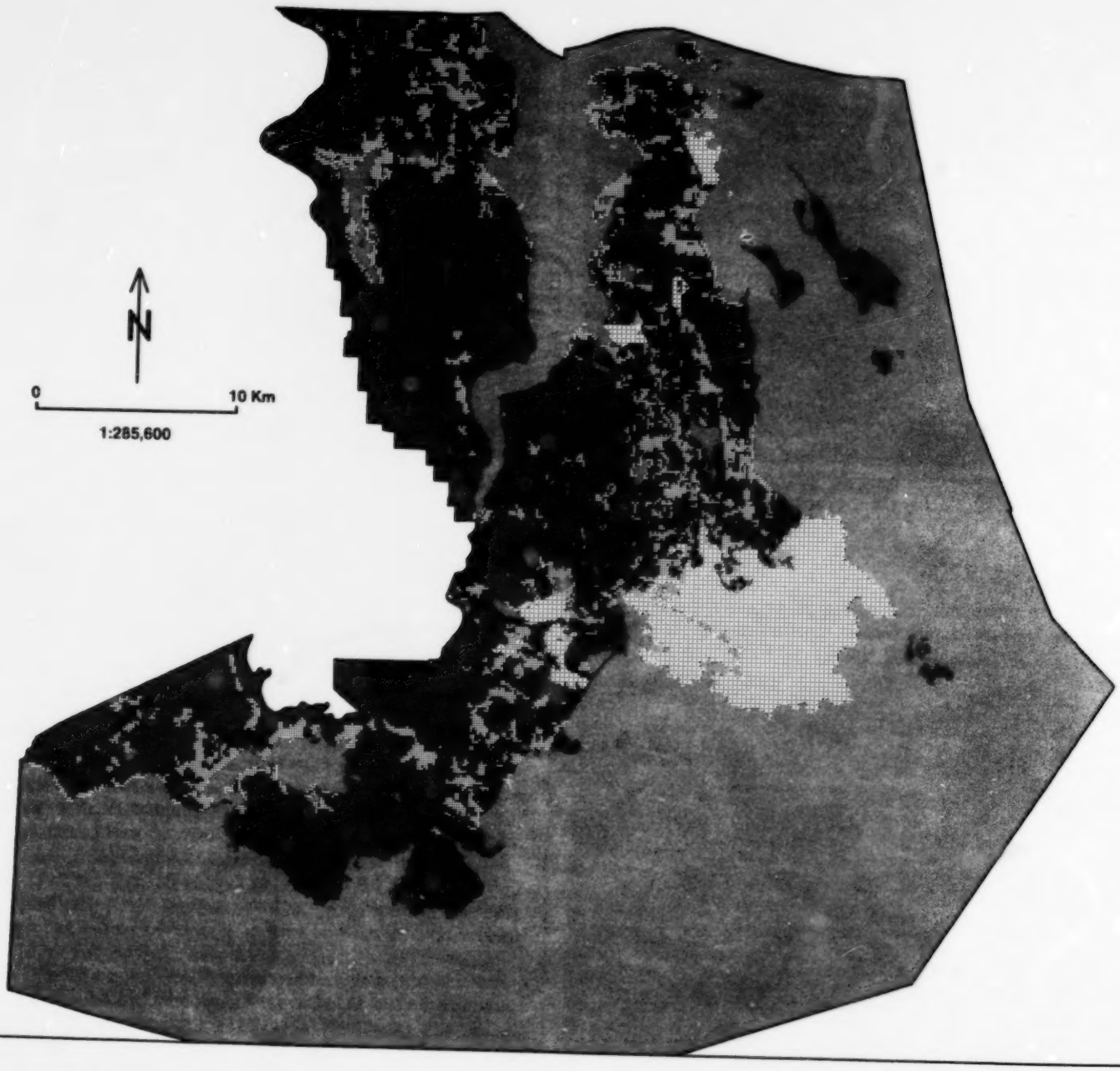
In the 1840's, immigrants first settled in the Victoria-Esquimalt area, attracted in part by the perceived agricultural potential. Most of the concentrated urban development (classed as urban undifferentiated) is in and around Victoria and Esquimalt. By 1980, 54% (4 559 ha) of Victoria UCR's urban undifferentiated area was situated on land with Class 1-3 capability for agriculture.

Residential dwelling activities are the third largest land use in the study area (8 222 ha). Almost 60% is in high-density residential use, distinguished by predominantly constructed cover.

The largest concentration occurs in Saanich DM, north of the City of Victoria. Other concentrations are adjacent to established urban areas such as Langford and Sidney and around the communities of Shawnigan Lake, Cobble Hill, Mill Bay and Sooke. Areas of low-density residential activities have a predominantly grass or wooded cover, and tend to be large rural-residential estates or hobby farms. They can act as a buffer zone between high-density residential and agricultural areas, but may also indicate where future residential development can be expected. Low-density residential activities are scattered throughout the study area, though notable conglomerations occur west of Metchosin, in the Shawnigan Lake-Cobble Hill-Mill Bay triangle, in Central Saanich DM to the north of Brentwood Bay, and in North Saanich DM near Deep Cove.

Outside the urban undifferentiated area, other urban uses accounted for less than 6% of the study area in 1980. Institutional land uses, most of which are situated adjacent to Esquimalt DM, and which include a naval centre, occupied the largest area. Transportation and communication consists primarily of hydro-electric transmission corridors (55%) and airport-related uses (22%).

VICTORIA URBAN–CENTRED REGION LAND USE 1980



- Agriculture
- Dwelling
- Other urban and extraction
- Urban undifferentiated
- Recreation and conservation
- Forestry
- No perceived activity with dominantly wooded cover
- Land in transition and idle

Source: GVRD GLDS

Environment Canada

Environnement Canada

Land use in 1980

	Hectares		%
Agriculture		8 215	**11.1**
Productive-Land Agricultural Activities	7 775		
Forage and grazing on improved cover	5 716		
Annually tilled row and close grown crops	720		
Grazing on unimproved cover	1 145		
Fruit and berry production	105		
Other productive-land agriculture (eg. nurseries, research)	89		
Site Agriculture	440		
Dwelling (Residential)		8 222	**11.1**
High Density[1]	4 867		
Low Density[2]	3 355		
Other Urban		4 208	**5.7**
Commercial, manufacturing and storing	430		
Transportation and Communication	1 311		
Institutional	2 235		
Recreation and cultural sites[3]	232		
Urban Undifferentiated[4]		8 511	**11.4**
Extraction		386	**0.5**
Recreation and Conservation		4 894	**6.6**
Land-dependent recreation	4 402		
Conservation and wildlife	492		
Forestry		4 519	**6.1**
Land in Transition		571	**0.8**
Unused		34 679	**46.7**
No perceived activity	34 261		
Idle	418		
Total Study Area		74 205	**100**

Notes: [1] Areas of high-density dwellings have a predominantly constructed cover.
[2] Areas of low-density dwellings have a predominant cover of grasses, shrubs or trees.
[3] Site recreation areas have a predominantly constructed cover.
[4] Urban undifferentiated is the concentrated built-up portion of the study area including the urban core.

Agriculture is an important contributor to the region's economy and the fourth largest land use. Dairying, vegetable production, and greenhouse and nursery operations are the most significant agricultural activities. Farming is becoming more intensive because of physical constraints and urban developments that limit agricultural land use in the UCR. The increasing use of irrigation for the production of livestock feed, an example of more intensive use, has resulted in substantially higher yields. Seventy percent (5 716 ha) of the agricultural activities in the study area consist of forage production and grazing on improved cover. Two major areas of concentration are in Central Saanich DM and the Cobble Hill-Mill Bay area. North Saanich DM and Saanich DM also have significant areas of this type of improved agriculture. Most of the annually tilled crops (e.g., onions, cabbage) are grown in Central Saanich. Agriculture activities, which use the land as a site (e.g., for greenhouses, dairy barns) and not as a production medium, account for 440 ha.

There are almost 20 000 ha with high capability for agriculture (88% is Class 3) in the study area. Only 29% (5 866 ha) is being used solely for agricultural purposes, and most of this land is in Central Saanich. In fact, 42% of all Class 1-3 agricultural capability land in the study area is considered permanently alienated owing to urban-related and high-density dwelling development. A further 1 258 ha of high agricultural capability land is covered by low-density dwelling activities, some of which may include hobby farms.

Regional parks constitute most of the 4 402 ha classed as land-based recreation. By far the largest park is the 1 400 ha East Sooke Regional Park in the south-western part of the UCR. Very little recreation land (less than 15%) has high capability for agriculture. The Greater Victoria Water Supply Area, situated to the west of Langford, is classed under the conservation category.

Forestry activities occupy approximately 4 500 ha or 6% of the study area. Most of these take place in forest reserves situated in the Shawnigan Lake area, though there are major exceptions on Sidney and James Islands off the east coast of Saanich Peninsula. Wildlife management is also practised in the forested area of both islands.

Almost one-half of the Victoria UCR is covered with trees and shrubs and has no perceived activity. Most of this 'unused' land is situated in the western highlands of Saanich Peninsula, west of Metchosin and Sooke, and in the Malahat highlands south and east of Shawnigan Lake. Although over 60% of the unused category has little or no capability for agriculture, there are about 3 500 ha of unused land classed as high capability (CLI Classes 1-3). The largest concentration is in Saanich DM.

Canada Land Inventory soil capability for agriculture

	Class	Area (ha)
High Capability	1	18
	2	2 357
	3	17 561
		19 936
Moderate Capability	4	6 487
	5	12 674
	6	2 272
		21 433
No Capability	7	31 775
Organic	O	1 061
		74 205

Gordon Head area of Saanich 1980
(Air photo courtesy of B.C. government)

Use of land and its capability for agriculture
(Hectares)

Land Use \ CLI Class	High 1-3	Moderate 4-6	None 7	Organic O
Agriculture	5 866	1 308	571	470
Dwelling - high density	2 373	1 654	810	30
- low density	1 258	1 237	818	42
Other Urban	1 387	1 743	1 044	34
Urban Undifferentiated	4 559	3 187	745	20
Extraction	21	269	83	13
Recreation and Conservation	736	713	3 391	54
Forestry	107	1 796	2 591	25
Land in Transition	92	178	291	10
Unused	3 537	9 347	21 432	363
TOTAL	19 936	21 432	31 776	1 061

Trends and Future Directions

Both population growth and the amount of rural land converted to urban-related uses declined between 1976 and 1980 compared to the preceding four-year period (11.4% to 8.0%, and 4 669 ha to 2 060 ha, respectively). The impact of urban growth on rural land, and in particular on agriculture, was more subtle in the 1976-80 period. Rather than a large, overall population increase, there was a noticeable change in the urban-rural population distribution, accompanied by increased low-density dwelling activities.

The Victoria Metropolitan Area (which encompasses the major portion of the Victoria UCR) had an urban population growth of only 6% between 1976 and 1981, while its rural population experienced a 32% increase. In particular, the rural population of Central Saanich increased by 45%, North Saanich by 25% and the Langford-Metchosin-western highlands area (Census – Capital Subdivision B) by 31%. In the northwest, the population of the Cobble Hill area (Cowichan Valley Regional District) grew by 130%. The 1980 land-use map of the Victoria UCR reflects this trend. Conglomerations of low-density dwelling areas in North and Central Saanich, Sooke and Metchosin area and the Shawnigan Lake-Cobble Hill-Mill Bay triangle correspond to the increases in rural population cited above.

Agriculture is a dominant land use in all these areas of increased rural population. The attraction of a rural lifestyle, together with improved commuting transportation networks to the major centres, have drawn increased numbers of people to settle in these low-density areas. The effect of these rural residential estates on agriculture, however, can be to break up holdings and limit future agricultural options.

By 1980, Capital Regional District and Cowichan Valley Regional District, as well as most communities within the districts had developed official plans to guide and control urban and suburban growth. The plans encourage the preservation of viable agricultural areas and uphold provincial Agricultural Land Reserves. Residential policies have been designed to curb scattered residential growth, so existing subdivided land must be infilled, and further development must proceed around established urban areas or in compact communities.

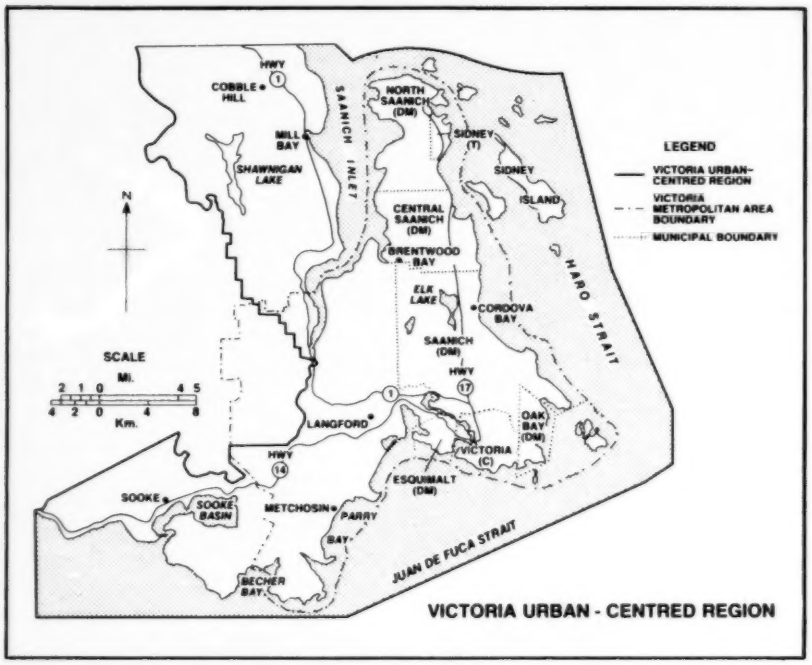
A comparison of CLUMP 1976 and 1980 land-use maps indicates that the infill process is already under way in Saanich DM and around Langford and Sooke.

Victoria Metropolitan Area's official plan directs most new urban development around existing urban areas in North

Saanich DM, toward the Langford-Colwood urban area, and to the low agricultural capability highlands west of Saanich.

Future monitoring could assist in determining the success of these plans in directing urban growth away from prime agricultural areas in the Victoria UCR.

Studies such as this one contribute to a national overview of land-use change and its impact on agricultural land. Land-use change monitoring assists in the implementation of the Federal Policy on Land Use by addressing nation-wide concerns such as the irreversible loss of high quality agricultural lands, and encouraging sound land-management strategies.



Résumé

Le présent feuillet est consacré à l'utilisation des terres dans la région de Victoria. L'étude, qui a été realisée dans le cadre du Programme de surveillance de l'utilisation des terres au Canada, traite de la distribution de l'utilisation des terres en 1980 de la région de Victoria, de l'urbanisation des terres entre 1976 et 1980, du potentiel agricole des terres urbanisées et de l'utilisation des meilleures terres agricoles de la région étudiée. Pour de plus amples renseignements concernant le programme comme tel ou les banques de données, écrire à l'adresse qui apparaît ci-contre.

For further information

Fact sheets for other UCRs are being produced, together with a national fact sheet that will summarize rural to urban land conversion data for all UCRs. Digital data are permanently on file with the Canada Land Data Systems and are accessible for analyses on a cost-recovery basis. Further information on CLUMP and the data sets can be obtained from the address below.

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